

Focus Stacking for Landscapes

For many, most people will have encountered and used focus stacking in relation to Macro photography of insects, where it is common practice to take 20 or more (- hundreds) of images, to be sure to overcome the physical limitations of short depth of fields from wide open apertures.

However, the case can be true also for Landscape photography and for similar reasons. Many may argue that this may be an unnecessary complication. But there is a good case for it to take your photography up to the next level!

Let's consider the potential problems. Many times, in photographing a Vista, we like to have front to back sharpness from our feet to the furthest distance or infinity. To achieve this, we have often set our apertures to f16 or even as high as f22 to get all in focus. As a result of this we have achieved a reasonable level of sharpness BUT we know that the dreaded Diffraction Errors have crept in which make the image ever so slightly blurred and not as pin sharp as we would like.

We have reduced our f-Stop down to f11 and found we can get good resolution with Hyperfocal Distancing, but at the expense of the very far distance or very near distance dependent upon where you focused. You can't seemingly have it both ways ("You canny change the laws of physics, Cap'n!").

Of course, the above applies to Full Frame but gets even lower with Cropped sensor cameras and u4/3rds. Many aficionados will argue that some diffraction starts with f11 and is noticeable at f16.

Continuing with the full frame story, on most occasions with our typical focal lengths for landscapes and at f11 the average nearest focal sharpness kicks it at around 8 ft or 3.0 metres, assuming you need to keep the distance in focus, thus you lose the foreground. **It's all about that front 10 ft!**

Most digital camera lenses are at their sharpest (sweet-spot) between f5.6 and f8 which is woefully too short for a fully sharp image (u4/3 people do your own maths!).

Looking into the Depth of Field (DoF) tables for your lens (Paper or Photo pills) will tell you where YOUR particular lens reaches infinity for any particular f-stop, and subsequently what the Dof Near point will be. We must find a way of getting ultra-sharp images for the foreground; hence we need to focus stack.

A word of warning though! Some well-known landscape photographers have made their careers getting images ultra-sharp front to back, with incredulous detail in the foreground, e.g. Joe Cornish. But you must consider how the image will be perceived by the viewer.

It's actually unnatural to have images sharp front to back! Consider the eye and look at a distant object and it will be sharp, and then at a close-up object which the eye will then refocus on to be sharp, but if you hold your gaze and perceive what's going on in your peripheral vision, everything there is decidedly unsharp! So, when viewing a printed image in 2D your eye can take in all the information in one focal plane and if a small image, this can look wrong! Photographers like Joe Cornish get around this by printing images at A2, A1 and A0, where the eye cannot take in the whole image in one go and hunts around refocussing on different parts.

That said, it's still worth doing since many of us will print at A3 where this still works from a close-up viewpoint. Gimmick or matter of taste?!

So what is a focus stack?

Fortunately, for Landscapes we don't need tens or hundreds of images, just about 4 or 5 in most cases. I.e., 4 or 5 separate images taken each with a different focus point to achieve the desired sharpness for the front image layers. These can be taken manually by focussing on three or four shots in the bottom third of the image (vista), or with many newer cameras, can be set to do automatically after focussing on the first image at 1m range. The camera does the rest and will stop at infinity anyway.

Be careful not to go to the other extreme of ultra-wide apertures and a wide distance between shot or you would get blurred bands between. For Landscapes I recommend starting at f 8 and experimenting. (If you set for less, e.g. f5.6, then you will need more images probably about 16-20!)

The 4 or 5 images are then aligned and blended in Photoshop which is perfectly adequate in my view for Landscapes, rather than the addition expense of the Helicon Focus Stacking Software, the Macro people use.

So, explore what your camera will do and learn how to use it for your model. It may be called Focus Stacking, Blending or Bracketing. Often there is an enabling menu to turn the feature on and set the camera up, and then a secondary menu to define the parameters for the automation. E.g. number of shots (5) step size (how far it increases the focal length for each shot) (5-10) and an interval delay between each shot (0) usually set for zero for landscapes. If you want to be a picky perfectionist look up the DoF table for your lens / camera combination and work out how many steps and how big from the 1M shot to the nearest DoF of the ultimate shot (5). Experiment!!!

Alternatively, do it MANUALLY by moving the focus in tiny steps for the first three shots up the image from the bottom and taking an image each time.

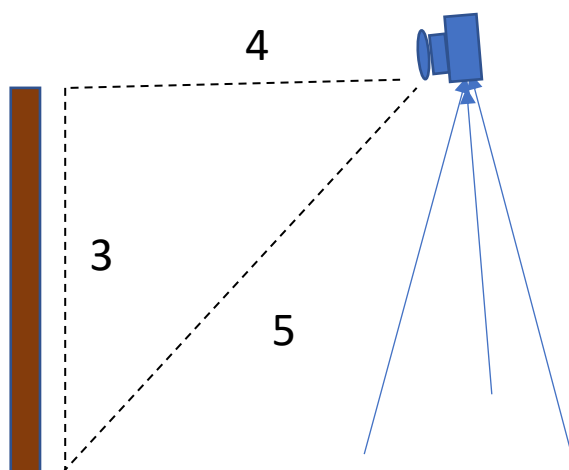
Use a tripod and remember Focus Stacking on moving water, lakes and wind driven trees might not work so well!

You now should have 4 or 5 images.

(Note though that if you still went for f16 you would only need 2 shots, but it rather defeats the object of working around your lenses sweet spot!). I've found f8 is a good compromise.

Don't do this!

Just a word of warning to those doing close-up focus stacking on a short f stop.



Say you have a post or a wall as your foreground interest e.g. Groins at the Seaside. Your instinct is to focus on the ground as your front focus start point, nearest your feet, but this would be wrong, since it isn't the nearest point to the camera!

A bit of basic geometry shown here with a 3/4/5 triangle. Your focus distance to the base of the post is 5 but the top of the post will be nearer to lens at 4 so if you started your focus stack at the bottom, the top will be out of focus outside the range.

Always focus on the nearest point to the camera, (i.e., the Top) the base and ground will always then be inside the focus range.

Post processing.

OK now it's time to stack the images.

If you're using Lightroom do some pre-work on the images for very basic adjustments for levels etc on each of the images, I suggest you turn off sharpening.

Now remember **Lightroom does NOT do Focus Stacking**, the Photo-merge HDR and Stacking is for exposure blending.

You now need to select and take all the images into Photoshop. Select the images and then right click > edit as STACK in Photoshop.

Once the stack has built in photoshop, rearrange the images so that the lowest numbered image is at the bottom with the remainder ascending.

Next ALIGN THE IMAGES. Absolutely vital since the image size changes as the focal length increases (Select all layers and **Edit> Auto Align Images > Auto.**)

Once the images are aligned you can the blend the stack. Photoshop will do a pretty good job of taking all the sharp element from each across into the final blend) Select all layers and **Edit > Auto Blend Layers**).

However.... You may wish to do this manually in Photoshop to be sure you know which parts of the various images show through in focus blending; this is covered below.

Also taking on further to the next level, we intimated that we ultimately want to combine Focus Stacking with Exposure Blending for the ultimate image.

Continuing from the above using the basic method, in addition to the 4-5 images you took in the initial Focus Stack you will need to take an additional 2 sets of 4-5 images which have a different exposure range. This is probably done best Manually by repeating the above steps but with the next set under-exposed by 2 stops. (Do this by manually winding the exposure of the images down). And then repeat the process by going over-exposed by 1 or 2 stops. (Experiment! I often find that 1 over is bright enough for bright contra-jour to avoid the sun being blown out).

Once you have focus stacked the three sets of images go on the Exposure Blend them in ways described previously (separate lecture). Now all this sounds complicated but it isn't if you simply follow the process and let the automation do the rest for you.

So in summary:

1. USE A TRIPOD
2. Get the correct exposure for your shot using f8 – f11
3. Take around 4 images with different focus points from 1metre through to around 1/3rd into the image.
4. Do basic corrections and apply to all the images.
5. Take into Photoshop and ALIGN the images
6. The simply focus blend the images.

If you need to Exposure blend as well

Then:

7. Repeat the above with 2 other exposures e.g.2 stops under and 1 or 2 stops over.
8. Repeat 1-6 for each of the sets
9. Exposure Blend the 3 sets together.

Finally, as mentioned if you wish to do this manually for finer control AND combine with Exposure Blending preparation then here is an excellent technical article on how to do this. But you will need to understand masking in Photoshop, but the steps are explained here.

Personally, I think that Photoshop Blending does all this for you and creates the masks as appropriate; so, this may be a step too far! It's good to see how others think.

<https://fstoppers.com/education/how-focus-stack-image-and-prepare-it-exposure-blending-470086>